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(54) POS Terminal device.

(57) A POS terminal device comprising a keyboard for entering sales data, a card for storing data representing an accumulated sale amount, a card reader/writer for reading and writing the data representing the accumulated sales amount to and from the card, and a processing unit for controlling the card reader/ writer to augment the data representing the accumulated sales amount with a sales total for a transaction computed from the entered sales data. The data representing an accumulated sales amount can be used to credit a customer by either discounting a sales total when the data exceeds a predetermined value, or by issuing a refund based on the accumulated sales amount for a period of time.

Fig. 4

EP 0 253 240 A1
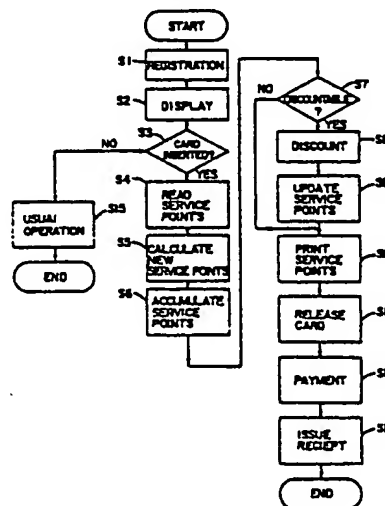
POS Terminal Device

Background of the Invention

1. Field of the Invention

This invention relates to a POS (point of sale) terminal device, and more particularly to such a POS terminal that provides a customer with a credit in the form of a discount or refund according to an accumulated sales amount.

2. Discussion of the Pertinent Art

Conventionally, some stores and supermarkets offer a customer such services as a refund, a discount, or a gift by issuing coupons, stamps, or the like according to a sales amount. A local supermarket, for example, may provide a refund to a customer according to a total annual sales amount based on a summation of the sales amount of each transaction receipt for a year. These conventional ways for offering such services, however, causes significant burdens both to a store and a customer in terms of managing and calculating a number of coupons, stamps, and/or receipts having sales amounts printed thereon.

Summary of the Invention

To solve these problems, this invention provides a POS terminal device which issues a card having a value thereon representing an accumulated sales amount which is augmented by new sales data each time a customer shops in a store, so that a customer can receive a service according to his accumulated sales amount without annoying management of many receipts and calculation of his sales totals over a period of time.

According to this invention a POS terminal device comprises data input means for entering sales data concerning items purchased by a customer, calculation means for calculating a sales total according to the entered data, a card reader/writer for reading and writing data representing an accumulated sales amount from and to the card, means for augmenting data representing accumulated sales as read from a card with data representing a calculated sales total from a transaction, and means for determining an amount of money to be credited to a customer based on the data representing accumulated sales. Thus, a customer's accumulated sales amount can be record-

ed and used to verify the customer's entitlement to various store services without requiring cumbersome paper work on the part of the store or the customer.

The above device and its objects, features and advantages will be better understood from the following detailed description of the invention which is provided in connection with the accompanying drawings.

Brief Description of the Drawings

Fig. 1 shows a block diagram representing a preferred embodiment of this invention;

Fig. 2 shows a conversion table located in RAM 10 of Fig. 1;

Fig. 3 shows data stored in a service card;

Fig. 4 shows a flow chart representing an operation of the preferred embodiment of this invention;

Fig. 5 shows the service card of Fig. 2 used in the preferred embodiment of this invention;

Fig. 6 shows a sample of a receipt of the preferred embodiment of this invention;

Fig. 7 shows another sample of a receipt of the preferred embodiment of this invention;

Fig. 8 shows a perspective view representing a POS terminal containing a second embodiment of this invention;

Fig. 9 shows a structure of a RAM area used in the second embodiment of this invention;

Fig. 10 shows a memory structure of a card used in the second embodiment of this invention;

Fig. 11 shows a flow chart representing an operation of the second embodiment in a registration mode;

Fig. 12 shows a flow chart representing an operation of the second embodiment in refund mode;

Fig. 13 shows a sample of a receipt issued by the second embodiment of this invention; and

Fig. 14 shows a sample of refund slip issued by the second embodiment of this invention.

Detailed Description of the Invention

Referring to Figs. 1 and 3, an embodiment of a POS terminal device according to this invention includes a CPU 1, a keyboard 2, a card reader 3, a display 4, a card reader/writer interface 5, a card reader/writer 6, a printer 7, a communication interface 8, a ROM 9, and a RAM 10. The keyboard 2 is used for entering sales data, for example, com-

modity prices, item numbers, and department codes for a sales transaction. The card reader 3 is used for reading data from a credit card when a customer requests a transaction using a credit card. The display 4 displays data entered by keyboard 2. The card reader/writer 6 reads data from and writes data to a magnetic strip 14 of a service card 13 which bears the data shown in Fig. 3. This data includes a store code, a time duration and a value called "total service points." The latter value represents an accumulated amount of sales by the customer over a period of time, and will be discussed in more detail below.

The communication interface 8 transmits the data of a credit card read by card reader 3 to a host computer 11 of a credit company and receives therefrom the outcome of authorization.

The ROM 9 has a program represented by a flow chart shown in Fig. 4. In RAM 19 are stored various kinds of data including a conversion table 12 shown in FIG. 2. The conversion table 12 stores percentages for converting from a registered sales total to "service points" which are accumulated on service card 13.

Referring to Fig. 5, service card 13 is shown as having a magnetic strip 14 in which data such as store code, duration, and total service points are stored. Also, a store name shopping date, service points at each shopping occurrence, and total service points are visibly printed on the service card 13. The service points are used to determines when certain services are offered to a customer. For purposes of further explanation, it will be assumed that when the level of service points reaches a predetermined value, a discount on a registered transaction total is given. In this situation, when the predetermined value is reached and a discount given, the accumulated total service points is correspondingly reduced, reflecting that a discount has been given, and the new service point value is then stored on service card 13. Each time a transaction is completed, the sales total for the transaction is converted to a value of service points which is added to the service points which were previously accumulated on the service card 13. The new accumulated value of service points is then checked to determine·if the predetermined value is exceeded. If it is, the discounting service is conducted on the sales total for the just-completed transaction as described above and a new, lowered service point value is determined and placed on service card 13. If the new accumulated value of service points does not exceed the predetermined value, then that new accumulated value is stored on service card 13 as the total service points.

Now, referring to Fig. 4, a specific operation of the first embodiment of this invention is described in detail.

In step 1, an operator enters purchasing data into the terminal, such as commodity prices, item numbers, and department codes. Upon completing these operations, the operator presses a transaction key (not shown). The, CPU 1 causes a sales total to be registered and displayed in step 2. In step 3, the CPU 1 inquires if service card 13 has been set in card reader/writer 6. If it is the first visit by the customer to the store, he is asked whether he needs a service card. In response to his positive answer, a new service card 13 is issued for him and inserted in card reader/writer 6.

If the customer has no service card 13 and does not want a new one, there will be no service card in card reader/ writer 6 and this is detected in step S3. A conventional detector (not shown) is used for detecting the presence of service card 13 in card reader/writer 6. If no card is present, then conventional transaction processing is conducted in step S15 and the transaction is completed.

If a service card 13 has been set in card reader/writer 6, this is detected in step S3 and the store code, duration, and service points data stored on card 13 are then read in step 4. Following this, service points for the just-registered transaction are calculated in step 5, based on the total sales amount determined in step 2. In this calculation, CPU 1 selects one of a plurality of conversion rates listed in conversion table 12 according to the registered total sales amount and/or the total service points read from card 13 in step 4. For example, 0.001 may be selected as a conversion rate and multiplied by total sales amount to calculate service points corresponding to the just registered transaction.

Following this, CPU 1 adds the newly calculated service points to the total service points read from card 13 in step 6. In step 7, the CPU 1 determines whether the new total service points has reached a predetermined value for giving a discount. If yes, the sales amount total just registered is discounted by the amount determined by the value of the service points and the discounted amount is displayed in step 8. Following this, in step 9 the total service points are reduced, reflecting the giving of a discount, by being subtracted by the predetermined value of service points which must be reached before a discount is given, producing a renewed total service points value. Then, the renewed total service points are stored in service card 13 and also printed on card 13 (step 10).

If in step 7 the total calculated service points are less than the predetermined value, then the new total service points are immediately recorded on card 13 in step 10 without a discount being applied and the operating procedure proceeds to step 11.

In step 11, the service card 13 is taken from card reader/writer 6 and handed back to the customer. Following this, payment for the registered transaction is performed on the basis total sales amount, which may have been discounted, (step 12) and a receipt as shown in Fig. 6 (for a discounted case) or Fig. 7 (for a non-discounted case) is issued (step 13).

As evident from the foregoing, a service such as a discount is selectively applied depending on the value of the total service points accumulated by a customer. When the service is given, the total service points are adjusted downwardly. Since the total · service points are recorded on service card 13, the paper work burden associated with keeping track of sales receipts and amounts is entirely eliminated.

Fig. 8, shows a perspective view of a POS terminal containing a second embodiment of this invention.

In this embodiment, an accumulated sales amount is recorded on a refund card and is updated for each transaction. At the end of some predetermined period of time, e.g., one year, the customer's accumulated sales amount is read from the refund card and a refund is issued in accordance with the accumulated sales amount for the period. For example, a refund based on a percentage, e.g., 1% of the accumulated sales amount, may be given. A detailed description of this embodiment now follows.

As shown in Fig. 8, the POS terminal includes a keyboard 21, a display 22, a printer 23, a cash drawer 24, and a card reader/writer 25. The keyboard 21 has a mode switch 211 for setting a mode such as registration mode R, or refund mode P. The internal structural organization of the POS terminal is the same as shown in Fig. 1. A RAM 10 of the POS terminal has a storage area configuration as shown in Fig. 9. An area 281 is assigned for commodity department codes, and corresponding totalizers and counters. An area 282 is an itemizer which totals sales amount for each customer. Areas 283 and 284 store information concerning each of a plurality of refund cards 20, such as an accumulated sales amount and a refund amount, respectively

Fig. 10 shows a memory configuration of a refund card 20 which is used with this embodiment. An area 101 is provided for commodity department codes and corresponding totalizers. Areas 102 and 103 are assigned for an accumulated sales amount and its card number, respectively.

Now referring to Figs. 11 and 12, an operation of the second embodiment of the POS terminal device will be described hereinafter. Fig. 11 shows an operation in a registration mode, while Fig. 12 shows an operation in a refund mode.

In Fig. 11, CPU 1 first determines in step 3 whether the present selected mode (set by 211) is a registration mode. If not, the program jumps to other conventional routines (not shown); however, if the present mode is a registration mode, registering operations such as entering commodity prices and department codes are performed in step 32. Following these registering operations, totalizers and counters corresponding to department codes to which purchased items relate are updated in step 33. Next, CPU 1 determines in step 34 if a refund card 20 has been set in card reader/writer 25 (corresponding to the card reader/writer 6 of Fig. 1). If it has, then totalizer area 101 of refund card 20 is updated in step 35 in accordance with data concerning the purchased items. If card 20 is not found in card reader/writer 25, step 35 is skipped and the procedure proceeds to step 36, where the CPU 1 determines if all purchased items have been registered. If not, a cycle of steps 2 to 5 is repeated until the last commodity data has been input and a yes response is received in step 36.

After this, CPU 1 inquires again in step 37 whether the card 20 is inserted into reader/writer 25. If the card is not inserted the CPU 1 proceeds to step 11 where a usual receipt is issued. If the card has been inserted in card reader/writer 25, as detected in step 37, the accumulated sales amount 102 of the refund card 20 (Fig. 10) is augmented in step 38 by the amount stored in itemizer area 282 (Fig. 9). Thus, upon completion of each transaction, the accumulated sales amount 102 on refund card 20 is updated by adding the sales amount of the new transaction to the old accumulated sales amount.

Following this, in step 39, a refund amount is calculated based on the updated accumulated sales amount 102. this refund calculation is performed so that a customer may know how much refund he is presently entitled to based on his accumulated sales amount. Following this, in step 40 the CPU 1 causes the calculated refund amount to be printed together with its card number on a transaction receipt and the receipt (shown in Fig. 13) is issued in step 41. Thus, whenever a customer goes shopping, his sales amount is accumulated in area 102 of his card and a refund to which he is entitled is calculated based on the updated sales amount and printed out on a receipt for his information.

Fig. 12 shows the operational steps for giving a customer his refund. Referring to Fig. 12, when an operator enters a refund instruction through a keyboard 21 in step 42, CPU 1 inquires in step 43 whether the present mode is a refund mode and whether a refund card has been inserted in card reader/writer 6 (step 44). If a yes response is received in the both steps 13 and 14, the accu-

mulated sales amount from area 102 and its card number from area 103 are read out of the card and the accumulated sales amount is stored in the RAM area 283 corresponding to its card number in step 45. A refund is then calculated based on the readout accumulated sales amount in step 46 and the amount of refund is printed on a refund slip shown in Fig. 14 in step 47. The calculated refund is also stored in the RAM area 284 corresponding to its card number in step 48 and the accumulated sales amount area 102 on the card is then cleared, i.e., reset to zero, in step 49.

A slip 40 as shown in Fig. 14 is used as a refund slip and a customer receiving this slip is entitled to a refund according to the amount printed thereon. This slip 40 differs from an usual receipt 30, so that these forms are not confused in their use.

The second embodiment of the invention is particularly useful for issuing periodic refunds to a customer based on his accumulated sales amount. It too eliminates burdensome paper work for the store and customer in keeping track of the accumulated sales amount.

In both the first and second embodiments the customer's card contains data representing an accumulated sales amount. In the first embodiment the data is in the form of accumulated "total service points", while in the second embodiment it is in the form of an actual monetary amount. It should be apparent that either format can be used with either embodiment.

While preferred embodiments of the invention have been described and illustrated, it should be apparent that many modifications can be made without departing from the spirit and scope of the invention. Accordingly, the invention is not limited by the foregoing description, but is only limited by the scope of the appended claims.

Claims

1. A POS terminal device for use with a card, comprising:
data input means for entering sales data concerning items purchased by a customer,
calculation means for calculating a sales total according to the entered sales data,
card reader/writer means for reading and writing data representing accumulated sales from and to a card which has an area for storing said data representing accumulated sales,
means for augmenting data representing accumulated sales read from said card with data representing said calculated sales total; and

means for determining an amount of money to be credited to a customer based on the data representing accumulated sales.

2. A POS terminal as in Claim 1, wherein said means for determining an amount of money to be credited to a customer comprises means for discounting said sales total based on said data representing accumulated sales.

3. A POS terminal as in Claim 1, wherein said means for determining an amount of money to be credited to a customer comprises means for determining a refund due to a customer based on said data representing accumulated sales.

4. A POS terminal device as in Claim 2, wherein said discount means discounts said sales total when said data representing accumulated sales reaches a predetermined value.

5. A POS terminal device as in Claim 3, further comprising means for providing an indication of the amount of said refund.

6. A POS terminal device as in Claim 5, wherein said means for providing an indication of the amount of said refund provides a printed record of said refund amount.

7. A POS terminal device as in Claim 6, wherein said printed record is in the form of a refund slip.

8. A POS terminal device as in Claim 2, further comprising means for determining if said data representing said accumulated sales exceeds a predetermined value and, if so, for causing operation of said discounting means.

9. A POS terminal device as in Claim 8, wherein said data representing said accumulated sales is in the form of an accumulated total service points, wherein the number of accumulated service points corresponds to an amount of accumulated sales.

10. A POS terminal device as in Claim 8, further comprising means for reducing the value of said data representing said accumulated sales when said sales total is discounted and for causing said card reader/writer means to write the reduced data representing said accumulated sales on said card.

11. A POS terminal as in Claim 10, wherein said data representing said accumulated sales is reduced by a value corresponding to said predetermined value.

12. A POS terminal device as in Claim 1, further comprising means for printing said data representing said accumulated sales on said card.

13. A POS terminal device as in Claim 9, further comprising means for printing said total service point value on said card.

14. A POS terminal device as in Claim 3, further comprising means responsive to a refund instruction for causing said card reader/writer
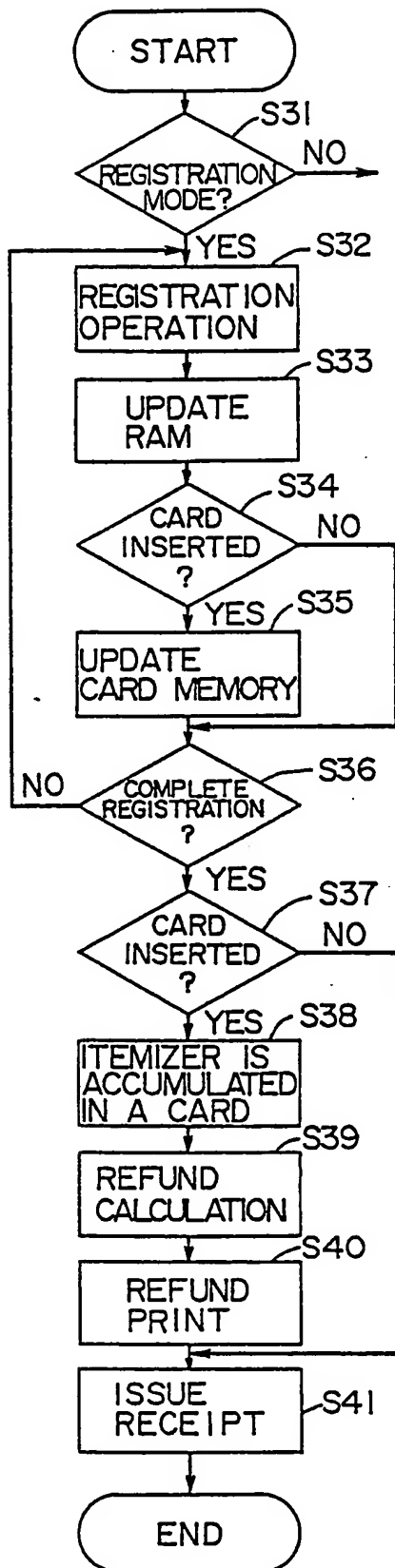
0 253 240

Fig. 11

START

S31 — REGISTRATION MODE? — NO →

YES

S32 — REGISTRATION OPERATION

S33 — UPDATE RAM

S34 — CARD INSERTED? — NO →

YES

S35 — UPDATE CARD MEMORY

S36 — COMPLETE REGISTRATION? — NO →

YES

S37 — CARD INSERTED? — NO →

YES

S38 — ITEMIZER IS ACCUMULATED IN A CARD

S39 — REFUND CALCULATION

S40 — REFUND PRINT

S41 — ISSUE RECEIPT

END

Fig. 12

START

S42 — REFUND INSTRUCTION

S43 — REFUND MODE? — NO → ERROR

YES

S44 — CARD INSERTED? — NO →

YES

S45 — READ ACCUMULATED SALES AMOUNT

S46 — REFUND CALCULATION

S47 — REFUND PRINT

S48 — STORE REFUND

S49 — CARD CLEAR

END